UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,752	07/29/2002	Benoit Couet	US57.0357-WO	8795

7590 03/01/2004

Schlumberger Doll Research
Intellectual Property Law Department
36 Old Quarry Road
Ridgefield, CT 06877

EXAMINER	
MILLER, ROSE MARY	

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/088,752	COUET ET AL.	
	Examiner	Art Unit	
	Rose M Miller	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-22 and 25-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-22 and 25-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 November 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 5 November 2003 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of copending application 10/088,723 has been reviewed and is accepted. The terminal disclaimer has been recorded.

2. The filing of a terminal disclaimer cannot be conditional. Therefore, the terminal disclaimer has been made part of the permanent record and the portion of any patent granted on this application which would extend beyond the expiration date of a patent resulting from copending application 10/088,723 (should such be patented) is disclaimed.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/GB00/04128, filed on 26 October 2000, a copy of which has been forwarded by the International Bureau and placed in this application.

Drawings

4. The drawings are objected to because empty diagram boxes are impermissible under 37 CFR §1.83(a) which recites as follows:

> *"The drawing in a nonprovisional application must show every feature of the invention specified in the claims. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a* ***labeled*** *representation (e.g., a* ***labeled*** *rectangular box)." (Emphasis added by Examiner)*

The empty diagram boxes 11, 91, 714, 722, and 825, found in Figures 1A, 1B, 1C, 1D, 7, 8, 9A, 9B, and 10 of the drawings, must be labeled with an appropriate descriptive phrase in addition to the reference legend all ready present. Appropriate correction is required.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities: Page 25, line 33 of the specification contains the spelling error "op rated".

Appropriate correction is required.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

7. Claim 16 is objected to because of the following informalities: Amended claim 16 contains the spelling error "xert" on line 8 of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> **The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.**

9. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 is rejected as being indefinite as claim 1, from which claim 15 depends, fails to provide a proper antecedent basis for the phrase "the sensor", found on line 1 of claim 15.

10. Claims 1-2, 4-15, and 34-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-2, 4-15, and 34-41 are rejected as being indefinite as the phrase "said monitor" (found on line 7 of claim 1 and line 10 of claim 34) lacks a proper antecedent basis. The claims previously recite a "deposit monitoring apparatus" and an "acoustic device". There is no specific recitation of the "monitor" being referred to.

Claims 2, 4-15 and 35-41 are rejected as they fail to correct the problems presented by the claim from which they depend.

11. Claims 1-2, 4-22, and 25-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claims 1, 16, and 34 are indefinite as each utilizes the term "adapted" to describe the "device" or "power supply" recited. The term "adapted" means "originally designed for one purpose but modified for another". In as much the Applicant has failed to identify the original purpose or the modification of the recited devices, it is not possible to determine the complete metes and bounds of the claimed invention.

Should the applicant intend the term --for-- such should be made clearer.

Claims 2, 4-15, 17-22, 25-33, and 35-41 are rejected as they fail to correct the problems presented by the independent claims from which they depend.

Claims 9, 12, 18, and 40 also utilize the phrase "adapted" and are indefinite for this reason.

For the purposes of applying art, the claims have been treated as if the phrase "adapted to operate" reads --operating-- and the phrase "adapted to supply" reads --for supplying-- in each of the claims reciting the indefinite phrases. Other phrases utilizing the word "adapted" have been taken as though they were a "means plus function" phrase appropriate to the claimed invention.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1, 2, 8-10, 15, 34-36, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kraus et al. (US 5,734,098)** in view of **"On-site, Near-Real-Time Monitoring of Scale Deposition"** by **D.H. Emmons, G.C. Graham, S.P. Holt and M.M. Jordan** (hereafter referred to as **Emmons et al.**).

Kraus et al. discloses a deposit monitoring apparatus comprising an acoustic device (thickness shear mode resonator) operating in a resonance mode including a monitoring surface directly exposed to fluids in an environment, wherein the deposition of material on the monitoring surface is monitored by measuring a change in resonance frequency of the acoustic device and a power supply supplying said acoustic device with electrical energy.

Kraus et al. discloses the claimed invention with the exception of the acoustic device operating in a resonance mode which is longitudinal and the monitoring apparatus being located in a hydrocarbon wellbore.

Kraus et al. discloses using a thickness-shear mode resonator to monitor mass deposition. **Kraus et al.** discloses at column 3 line 57 - column 4 line 7 that the

thickness-shear mode resonator operates by applying an oscillating electric field across the thickness of the quartz crystal. This produces a standing shear wave across the thickness of the plate (resonance state of the acoustic device, see **Granstaff et al. (US 5,201,215)** column 1 lines 18-29 and column 3 lines 39-44 for more information, **Granstaff et al.** fully incorporated by reference into **Kraus et al.**). This results in the surface exposed to the fluid environment moving predominately normal to itself. As Applicant has defined the "longitudinal mode" of the acoustic device used in the invention as "the surface of the device exposed to the fluid is move predominantly normal rather than parallel to the exposed surface" (see last paragraph of page 15 and first paragraph of page 16 of the specification), the acoustic device of **Kraus et al.** meets the definition of Applicant's "longitudinal mode". Therefore, the device of **Kraus et al.** operates in a "longitudinal mode" as defined by Applicant.

As for the deposit monitoring device being located in a hydrocarbon wellbore, **Emmons et al.** teaches in column 1, paragraph 4, of page 392 utilizing a thickness shear mode resonator to monitor deposits in "downhole applications" such as the immediate recognition of scaling caused by process changes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the invention of **Kraus et al.** in a "longitudinal" mode as the thickness shear device of **Kraus et al.** operates in manner consistent with Applicant's definition of a "longitudinal mode" and to utilize the invention of **Kraus et al.** in a hydrocarbon wellbore as **Emmons et al.** clearly teaches the advantages of utilizing a thickness shear resonator to monitor deposits in a downhole application of a hydrocarbon wellbore.

With regards to claim 2, it would have been obvious to one of ordinary skill in the art at the time the invention was made to either permanently or quasi-permanently mount the deposit monitoring device within the hydrocarbon wellbore as both **Kraus et al.** and **Emmons et al.** clearly teach utilizing the thickness shear mode resonator to automate chemical feed and to determine immediate scaling caused by process changes (see **Kraus et al.** column 5 lines 5-48 and **Emmons et al.**, column 1, paragraph 4 of page 392). One of ordinary skill in the art would have known that the

automation of such processes would require a monitoring device to be available permanently.

With regards to claim 8, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the monitoring surface on or near one of switches, valves, sleeves, mandrels, downhole separators, and sensors located within the wellbore as is well known throughout the art of wellbore monitoring that such devices are prone to scaling and that the scaling affects the operation of each one of the recited devices. As taught by **Emmons et al.**, the goal is better management of scale resulting in lowered operating costs. Therefore, one of ordinary skill in the art would want to monitor the scaling around the particular device in order to prolong the life of the device by not damaging the device due to the presence of excessive scaling or to compensate for the scaling present (as would be necessary should the scaling affect the output of the sensors claimed). Such actions would prolong the life of the equipment found within the wellbore and thereby lower the operating costs for the wellbore.

With regards to claims 9-10, **Kraus et al.** discloses the claimed invention including a deposit removal system (see column 5 lines 5-48) for at least partially removing the deposition from the monitoring surface (real-time analysis and monitoring includes both growth and removal of deposits), the deposit removal system being in a control loop (**Kraus et al.** discloses controlling the feed of chemicals) with said deposit monitor. As for claim 10, **Kraus et al.** discloses adding deposition inhibiting or removing chemical agents (see column 5 lines 38-40).

With regards to claim 15, **Kraus et al.** discloses simultaneously measuring mass deposition and fluid properties of the system under test. Therefore, **Kraus et al.** discloses meets the claimed invention of analyzing the deposited material.

With regards to claim 34, **Kraus et al.** discloses the claimed invention with the exception of specifically measuring the difference between a deposit of 600 microns from a deposit of 1050 microns. The system of **Kraus et al.** can easily distinguish between layers of deposits of the recited thicknesses, as the system of **Kraus et al.** is dependant upon the amount of mass deposited, not the thickness of the layer. The

difference in the two layers is sufficient to alter the resonance of the resonator of **Kraus et al.** as long as the **mass** of the layers is sufficient to alter the resonance. **Emmons et al.** teaches that the sensor can detect nanograms of deposit. It is only when the weight of the deposited layer becomes too great that the sensor is overloaded that results in the sensor being unable to distinguish such small differences. As Applicant has not claimed a particular mass which would overload the system of **Kraus et al.**, the system of **Kraus et al.**, in view of the teachings of **Emmons et al.**, discloses the claimed invention.

With regards to claim 35, it would have been obvious to one of ordinary skill in the art at the time the invention was made to either permanently or quasi-permanently mount the deposit monitoring device within the hydrocarbon wellbore as both **Kraus et al.** and **Emmons et al.** clearly teach utilizing the thickness shear mode resonator to automate chemical feed and to determine immediate scaling caused by process changes (see **Kraus et al.** column 5 lines 5-48 and **Emmons et al.**, column 1, paragraph 4 of page 392). One of ordinary skill in the art would have known that the automation of such processes would require a monitoring device to be available permanently.

With regards to claim 36, **Kraus et al.** discloses using a thickness-shear mode resonator to monitor mass deposition. **Kraus et al.** discloses at column 3 line 57 - column 4 line 7 that the thickness-shear mode resonator operates by applying an oscillating electric field across the thickness of the quartz crystal. This produces a standing shear wave across the thickness of the plate (resonance state of the acoustic device, see **Granstaff et al.** column 1 lines 18-29 and column 3 lines 39-44 for more information, **Granstaff et al.** fully incorporated by reference into **Kraus et al.**). This results in the surface exposed to the fluid environment moving predominately normal to itself. As Applicant has defined the "longitudinal mode" of the acoustic device used in the invention as "the surface of the device exposed to the fluid is move predominantly normal rather than parallel to the exposed surface" (see last paragraph of page 15 and first paragraph of page 16 of the specification), the acoustic device of **Kraus et al.**

meets the definition of Applicant's "longitudinal mode". Therefore, the device of **Kraus et al.** operates in a "longitudinal mode" as defined by Applicant.

With regards to claim 39, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the monitoring surface on or near one of switches, valves, sleeves, mandrels, downhole separators, and sensors located within the wellbore as is well known throughout the art of wellbore monitoring that such devices are prone to scaling and that the scaling affects the operation of each one of the recited devices. As taught by **Emmons et al.**, the goal is better management of scale resulting in lowered operating costs. Therefore, one of ordinary skill in the art would want to monitor the scaling around the particular device in order to prolong the life of the device by not damaging the device due to the presence of excessive scaling or to compensate for the scaling present (as would be necessary should the scaling affect the output of the sensors claimed). Such actions would prolong the life of the equipment found within the wellbore and thereby lower the operating costs for the wellbore.

15. Claims 11-14 and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kraus et al.** in view of **Emmons et al.** as applied to claims 1 and 34, respectively, above, and further in view of **Edgerton (US 4,092,858)**.

With regards to claim 11, **Kraus et al.** in view of **Emmons et al.** discloses the claimed invention with the exception of the deposit removal system using the acoustic device to exert a physical force onto the deposited material. **Edgerton** teaches using an acoustic device to exert a physical force (vibration) onto deposited material in order to remove the deposited material, the removal of such deposits known in the prior art as utilizing "ultrasonic cleaning" to remove unwanted deposits from surfaces. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of **Kraus et al.** in view of **Emmons et al.** with a means to physically remove the unwanted deposits as **Edgerton** teaches the principles of ultrasonic cleaning in order to keep a sensor body free of deposits which would inhibit the operation of the sensor.

With regards to claims 12-14, **Kraus et al.** in view of **Emmons et al.** discloses the claimed invention with the exception of the deposit removal system being near a sensor, the sensor selected from the group comprising optical sensors, electro-chemical sensors, and acoustic sensors, and the exposed surface being selected from the group of optical windows, membranes, or sensitive areas of acoustic sensors. **Edgerton** teaches the ultrasonic cleaning of an acoustic sensor and the surfaces of the acoustic sensor exposed to a particular environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Kraus et al.** in view of **Emmons et al.** to provide for the cleaning of a sensor found within the system as **Edgerton** clearly teaches that such cleaning provides for a better operation of the sensor and prolongs the life of the sensor.

With regards to claim 40, **Kraus et al.** in view of **Emmons et al.** discloses the claimed invention with the exception of the deposit removal system using the acoustic device to exert a physical force onto the deposited material. **Edgerton** teaches using an acoustic device to exert a physical force (vibration) onto deposited material in order to remove the deposited material, the removal of such deposits known in the prior art as utilizing "ultrasonic cleaning" to remove unwanted deposits from surfaces. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of **Kraus et al.** in view of **Emmons et al.** with a means to physically remove the unwanted deposits as **Edgerton** teaches the principles of ultrasonic cleaning in order to keep a sensor body free of deposits which would inhibit the operation of the sensor.

With regards to claim 41, **Kraus et al.** in view of **Emmons et al.** discloses the claimed invention with the exception of the deposit removal system being near a sensor. **Edgerton** teaches the ultrasonic cleaning of an acoustic sensor and the surfaces of the acoustic sensor exposed to a particular environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Kraus et al.** in view of **Emmons et al.** to provide for the cleaning of a sensor found within the system as **Edgerton** clearly teaches that such cleaning provides for a better operation of the sensor and prolongs the life of the sensor.

16. Claims 16-19, 22-25, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kraus et al.** in view of **Emmons et al.** and **Edgerton**.

Kraus et al. discloses a monitor to measure characteristics of fluids in an environment, the monitor having a monitoring surface that is directly exposed to fluids and a power supply for supplying electrical energy to said monitor.

Kraus et al. discloses the claimed invention with the exception of the monitoring apparatus being located in a hydrocarbon wellbore and a deposit removal system including an acoustic device exerting a physical force on the monitoring surface to at least partially remove a deposition of material from the monitoring surface.

As for the deposit monitoring device being located in a hydrocarbon wellbore, **Emmons et al.** teaches in column 1, paragraph 4, of page 392 utilizing a thickness shear mode resonator to monitor deposits in "downhole applications" such as the immediate recognition of scaling caused by process changes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the invention of **Kraus et al.** in a hydrocarbon wellbore as **Emmons et al.** clearly teaches the advantages of utilizing a thickness shear resonator to monitor deposits in a downhole application of a hydrocarbon wellbore.

As to the invention including a deposit removal system including an acoustic device exerting a physical force on the monitoring surface to at least partially remove a deposition of material from the monitoring surface, **Edgerton** teaches the ultrasonic cleaning of an acoustic sensor and the surfaces of the acoustic sensor exposed to a particular environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor of **Kraus et al.** in view of **Emmons et al.** to provide for the cleaning of a sensor found within the system as **Edgerton** clearly teaches that such cleaning provides for a better operation of the sensor and prolongs the life of the sensor.

With regards to claim 17, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the monitoring surface on or near one of switches, valves, sleeves, mandrels, downhole separators, and sensors located

within the wellbore as is well known throughout the art of wellbore monitoring that such devices are prone to scaling and that the scaling affects the operation of each one of the recited devices. As taught by **Emmons et al.**, the goal is better management of scale resulting in lowered operating costs. Therefore, one of ordinary skill in the art would want to monitor the scaling around the particular device in order to prolong the life of the device by not damaging the device due to the presence of excessive scaling or to compensate for the scaling present (as would be necessary should the scaling affect the output of the sensors claimed). Such actions would prolong the life of the equipment found within the wellbore and thereby lower the operating costs for the wellbore.

With regards to claim 18, **Kraus et al.** clearly discloses the monitor comprising an acoustic device operating in a resonance mode and the monitor measures deposition of material on the monitoring surface by measuring a change in resonance frequency of the acoustic device of the monitor.

With regards to claim 19, **Kraus et al.** discloses using a thickness-shear mode resonator to monitor mass deposition. **Kraus et al.** discloses at column 3 line 57 - column 4 line 7 that the thickness-shear mode resonator operates by applying an oscillating electric field across the thickness of the quartz crystal. This produces a standing shear wave across the thickness of the plate (resonance state of the acoustic device, see **Granstaff et al.** column 1 lines 18-29 and column 3 lines 39-44 for more information, **Granstaff et al.** fully incorporated by reference into **Kraus et al.**). This results in the surface exposed to the fluid environment moving predominately normal to itself. As Applicant has defined the "longitudinal mode" of the acoustic device used in the invention as "the surface of the device exposed to the fluid is move predominantly normal rather than parallel to the exposed surface" (see last paragraph of page 15 and first paragraph of page 16 of the specification), the acoustic device of **Kraus et al.** meets the definition of Applicant's "longitudinal mode". Therefore, the device of **Kraus et al.** operates in a "longitudinal mode" as defined by Applicant.

With regards to claim 22, **Kraus et al.** discloses using a deposition inhibiting or removing chemical agent as part of a deposit removal system (see column 5 lines 5-48).

With regards to claim 25, **Kraus et al.** discloses the monitor being selected from the group of optical sensors, electro-chemical sensors, or acoustic sensors (**Kraus et al.** discloses utilizing an acoustic sensor).

With regards to claim 33, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide for the acoustic device of the monitor being the acoustic device of the removal system as the system of **Kraus et al.** clearly utilizes the acoustic device both in measuring properties of the fluid environment and in controlling the removal of deposits from the measuring environment.

Allowable Subject Matter

17. Claims 5-7, 20-21, 26-32, and 37-38 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Marsh et al. (US 3,056,284) discloses a scale and corrosion measuring device and method.

Mansure et al. (US 5,827,952) discloses a method and apparatus for determining deposition-point temperature.

Johnson (US 6,131,659) discloses a downhole well corrosion monitoring apparatus and method.

Vig et al. (US 6,247,354 B1) discloses techniques for sensing the properties of fluids with resonators.

Sinha (US 6,286,370 B1) discloses a method using ultrasound for detecting materials on metal surfaces.

Atherton (US 2003/0101822 A1) discloses a sensor apparatus for use in downhole applications.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rose M Miller whose telephone number is 571-272-2199. The examiner can normally be reached on Monday - Friday, 7:30 am to 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RMM
5 February 2004

HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800